

CLAIMS

What is Claimed is:

1 1. (Amended) [In an] An odor trap apparatus for conveyance of wastewater to
2 an external drain, including:
3 a housing (32) having an interior and an opening (48) extending from the interior
4 to the external drain[-]; ~~[and]~~
5 a cartridge (22) having an exterior and receivable in the housing interior, ~~[and]~~
6 an opening (26) for receiving the wastewater, and an exit opening (78) disposed to
7 communicate with the housing opening ~~[-the improvement comprising:-]~~
8 housing cartridge-engagement implementation (60) associated with the housing
9 interior; ~~[and]~~
10 cartridge housing-engagement implementation (82) associated with the
11 cartridge exterior[-]; and
12 said housing and cartridge implementations having respective cooperative
13 mechanisms for effecting an interengagement therebetween for securing said cartridge
14 within said housing,
15 said housing and cartridge implementations (60, 82) have a mutual
16 arrangement that, when interengaged, align the cartridge opening with respect to the
17 housing opening to facilitate conveyance of the wastewater to the external drain.

1 2. The improvement according to claim 1 in which said housing opening
2 comprises a tube of given external dimension, and further including a plurality of
3 fittings sized differently from the external dimension of said tube to enable said housing
4 to be coupled to any size of fitting to the external drain.

1 3. The improvement according to claim 1,
2 in which said implementations (60, 82) define positions of initial unsecured and
3 final secured interconnections between said housing and said cartridge, and said
4 housing opening (48) and said cartridge exit opening (78) are aligned at the position
5 of final secured interconnection and misaligned at the position of initial unsecured
6 interconnection, and
7 further including a closure mechanism (52) for closing said housing opening (48)
8 when said housing opening and said cartridge exit opening (78) are at other than the
9 position of final secured interconnection, for blocking any unpleasant odors from sewer
10 gasses from entering said housing.

1 4. The improvement according to claim 3, in which:
2 said housing and said cartridge are cylindrical in configuration; and
3 said closure mechanism (52) comprises a lever having a swivelable coupling
4 to said housing, a cap (54) on said lever sized to block said housing opening (48), and
5 a coupling (56, 80) between said cartridge and said lever for enabling said lever to
6 swivel when said cartridge is rotated with respect to said housing.

1 5. The improvement according to claim 4 in which said coupling between
2 said cartridge and said lever comprises a projection (56) on said lever and a blind
3 opening (80) in said cartridge.

1 6. The improvement according to claim 4 in which said swivelable coupling
2 between said lever and said housing comprises a bifurcated pivot for enabling removal
3 of said lever from said housing.

1 7. The improvement according to claim 1 in which:
2 said housing and said cartridge are cylindrical in configuration;
3 said housing cartridge-engagement implementation (60) comprises at least one
4 L-shaped keyway having vertical and generally horizontal components (62, 64) joined
5 at an intersection; and
6 said cartridge housing-engagement implementation (82) comprises at least one
7 key fittable within said L-shaped keyway.

1 8. The improvement according to claim 7 in which said generally horizontal
2 component (64) is inclined downwardly from the intersection for enabling said key to
3 act as a cam to facilitate separation of said cartridge from said housing.

1 9. The improvement according to claim 1 in which:
2 said implementations (60, 82) define positions of initial unsecured and final
3 secured interconnections between said housing and said cartridge;
4 said housing and said cartridge are cylindrical in configuration;
5 said housing includes a bottom wall (46), a tubular wall (44) extending upwardly
6 from said housing bottom wall, and an opening for receipt of said cartridge;
7 said cartridge (22) includes a top wall (74), a bottom wall (72) and a tubular wall
8 (70) joining said top and bottom walls;
9 said cartridge housing-engagement implementation (82) comprises a plurality
10 of keys; and
11 said housing cartridge-engagement implementation (60) comprises a plurality
12 of L-shaped keyways equal in number to said keys, which are fittable respectively
13 therewithin, said keyways each having vertical and generally horizontal components

14 (62, 64) extending from said housing cartridge-receiving opening and joined at an
15 intersection,

16 each of said vertical components defining the position of initial unsecured
17 interconnection and extending downwardly from said housing cartridge-receiving
18 opening towards said housing bottom wall, and

19 each of said generally horizontal components (64), at its terminus
20 opposed from the intersection, defining the position of final secured interconnection
21 and being inclined downwardly from the intersection to facilitate, with said keys,
22 separation of the cartridge from the housing.

1 10. The improvement according to claim 9 in which:

2 said housing opening (48) and said cartridge exit opening (78) are aligned at
3 the position of final secured interconnection and misaligned at the position of initial
4 unsecured interconnection;

5 said cartridge housing-engagement implementation (82) and said housing
6 cartridge-engagement implementation (60) are angularly positioned unequally about
7 the peripheries of their respective cartridge and housing to ensure alignment of said
8 housing opening (48) and said cartridge exit opening (78) are aligned at the position
9 of final secured interconnection.

1 11. (Amended) The improvement according to claim 10 in which at least one of
2 said keys (82') and at least one of said mating L-shaped keyway horizontal keyways
3 (68') are horizontally dimensioned differently from at least one other of said keys (82")
4 and keyways (68") [~~said mating L-shaped keyway horizontal~~] for further defining the
5 aligned and misaligned positions of the respective final secured interconnection and
6 initial unsecured interconnection of said housing opening (48) and said cartridge exit

7 opening (78), to ensure alignment of said housing opening (48) and said cartridge exit
8 opening (78) are aligned at the position of final secured interconnection.

1 12. (Amended) The improvement according to claim 9 in which at least one of
2 said keys (82') and at least one of said mating L-shaped keyway horizontal keyways
3 (68') are horizontally dimensioned differently from at least one other of said keys (82")
4 and keyways (68") [~~said mating L-shaped keyway horizontal~~]] for defining an aligned
5 and a misaligned positions respectively of the final secured interconnection and the
6 initial unsecured interconnection of said housing opening (48) and said cartridge exit
7 opening (78), to ensure alignment of said housing opening (48) and said cartridge exit
8 opening (78) are aligned at the position of final secured interconnection.

1 13. (Amended) The improvement according to claim 12 in which:
2 said housing opening (48) and said cartridge exit opening (78) are aligned at
3 the position of final secured interconnection and misaligned at the position of initial
4 unsecured interconnection;
5 said cartridge housing-engagement implementation (82) and said housing
6 cartridge-engagement implementation (60) are angularly positioned unequally about
7 the peripheries of their respective cartridge and housing further to ensure alignment
8 of said housing opening (48) and said cartridge exit opening (78) are aligned at the
9 position of final secured interconnection.

1 14. The improvement according to claim 9 in which said horizontal
2 components are respectively provided with corrugated surfaces for cooperation with
3 said keys and, thereby, for enabling the cartridge to be locked within the housing at the
4 position of final secured interconnection.

1 15. The improvement according to claim 1 wherein said cartridge (22)
2 includes a top wall (74) in which the cartridge opening resides, and said top wall
3 includes a sloped upper surface (76a) adjacent to the cartridge opening for beveling
4 thereof to encourage flow of the wastewater into the cartridge opening and to prevent
5 retention of any liquid on said top wall due to surface tension effects.

1 16. The improvement according to claim 1 wherein said cartridge (22)
2 includes a top wall (74) which incorporates the cartridge opening, and wherein said
3 cartridge opening entry includes a plurality of openings through which the wastewater
4 passes, and further including:

5 a tool having hook-shaped projections therein for engagement with said
6 openings for enabling insertion into, and removal of said cartridge from said housing.

1 17. The improvement according to claim 16 in which said hook-shaped
2 projections are each provided with a hook for engagement with the underside of said
3 top wall adjacent said cartridge openings.

1 18. The improvement according to claim 17 further including:
2 protuberances positioned adjacent each of the cartridge openings and
3 extending from said under surface; and
4 protuberances on each of said hooks, said hook protuberances being adapted
5 to move over said cartridge opening protuberances for providing a latching
6 engagement of said tool with said top wall.

1 19. The improvement according to claim 1 further including an annular
2 groove (90) in one of said cartridge exterior and said housing interior, an O-ring (88)
3 positioned in the groove and comprising two pairs of upwardly and downwardly
4 extending annular ridges (88a, 88b) and an outwardly extending annular projection
5 (88c) for furnishing enhanced areas of engagement with the annular groove.

1 20. An odor trap apparatus for conveyance of wastewater to an external
2 drain, including:
3 a housing (32) having an interior and an opening (48) extending from the interior
4 to the external drain;
5 a cartridge (22) having an exterior and rotatably receivable in the housing
6 interior, and
7 an opening (26) for receiving the wastewater, and
8 an exit opening (78) disposed to be alignable with the housing opening
9 for providing a wastewater flow path;
10 a lever (52) for closing said housing opening (48) when said housing opening
11 and said cartridge exit opening (78) are at other than being aligned, for blocking any
12 unpleasant odors from sewer gasses from entering said housing, said lever having a
13 swivelable coupling to said housing, a cap (54) on said lever sized to block said
14 housing opening (48), and a coupling (56, 80) between said cartridge and said lever
15 comprising a projection (56) on said lever and a blind opening (80) in said cartridge for
16 enabling said lever to swivel when said cartridge is rotated with respect to said
17 housing.

1 21. (Amended) An odor trap apparatus for conveyance of wastewater to an
2 external drain, including:

3 a housing (32) having an interior and an opening (48) extending from the interior
4 to the external drain, and a plurality of L-shaped keyways in the interior having vertical
5 and generally horizontal components (62, 64) joined at an intersection;

6 a cartridge (22) having an exterior and rotatably receivable and sealable in the
7 housing interior, and further having

8 an opening (26) for receiving the wastewater,

9 an exit opening (78) disposed to communicate with the housing opening
10 for providing a wastewater flow path therewith, and

11 keys equal in number to said L-shaped keyways and fittable therein,

12 wherein said keys and said keyways have a unique orientation such that said cartridge

13 exit opening ~~[being alignable]~~ is aligned with said housing opening when said keys are

14 disposed fully within the keyway horizontal components.

1 22. The improvement according to claim 21 in which said generally horizontal
2 component (64) is inclined downwardly from the intersection for enabling said key to
3 act as a cam to facilitate separation of said cartridge from said housing.

1 23. An odor trap apparatus for conveyance of wastewater to an external
2 drain, including

3 a housing (32) having an opening (48) extending to the external drain, and

4 a cartridge (22) receivable in the housing and having

5 a top wall provided with a plurality of openings (26) therein for receiving
6 the wastewater,

7 an exit opening (78) disposed to communicate with the housing opening;
8 and
9 a tool having hook-shaped projections for engagement with said openings for
10 enabling insertion into, and removal of said cartridge from said housing.

1 24. The improvement according to claim 23 in which said hook-shaped
2 projections are each provided with a hook for engagement with the underside of said
3 top wall adjacent said cartridge openings, and
4 protuberances positioned adjacent each of the cartridge openings and
5 extending from said under surface; and
6 protuberances on each of said hooks, said hook protuberances being adapted
7 to move over said cartridge opening protuberances for providing a latching
8 engagement of said tool with said top wall.